



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,971	03/22/2006	Warren Thomas Johnson	2005P11585WOUS	3709
28524	7590	03/20/2009	EXAMINER	
SIEMENS CORPORATION INTELLECTUAL PROPERTY DEPARTMENT 170 WOOD AVENUE SOUTH ISELIN, NJ 08830			ANDERSON, DENISE R	
		ART UNIT	PAPER NUMBER	
		1797		
		MAIL DATE	DELIVERY MODE	
		03/20/2009	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/572,971	JOHNSON, WARREN THOMAS	
	<b>Examiner</b>	<b>Art Unit</b>	
	Denise R. Anderson	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 13 March 2009.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.  
 4a) Of the above claim(s) 12 and 13 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-11 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) 1-13 are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 22 March 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____.   | 6) <input type="checkbox"/> Other: _____ .                        |

**DETAILED ACTION**

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 102***  
***Nakatsuka Reference***

2. Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakatsuka (Patent Pub. No. JP11076769, Mar. 23, 1999 – The esp@cenet Abstract in English, the publication, and a machine translation to English).
3. The examiner has requested that JP11076769 be translated by a person and expects that to be done within a month. The examiner will forward a copy of the translation to the applicant as soon as it arrives. In the meantime, the prosecution can proceed with the machine translation.
4. Regarding claims 1 and 10, Nakatsuka discloses "a cleaning method of a filter membrane module" of the "hollow fiber module" type where, during filtration, a pressure differential is applied and liquid flows into the hollow fibers and permeate flows out the hollow center. Nakatsuka, esp@cenet Abstract, lines 1-2; Translation, Detailed Description, ¶ 17, lines 1-4. Nakatsuka further teaches, "In the cleaning method of the filter membrane module 11 for recovering the water permeability by cleaning the filter membrane module 22 degraded in water permeability of a membrane purifying system 10 of water with the liquid chemical, at least one point of time before and after the liquid chemical is supplied to the filter membrane module 11 or at the both point of time, a gas pressurizing process for pressurizing a gas from the permeation side of the filter membrane of the filter membrane module 1 at >=20 kPa to below the bubble point is provided for 1-5 min." Nakatsuka, esp@cenet Abstract, lines 9-22 and Figure 1 shown

in the Abstract and the patent. Nakatsuka also discloses that, during filtration, there is a backwash using filtrate (permeated water) once every 45 minutes for one minute in Figure 1 and, in the Translation's Detailed Description, at ¶ 20, lines 1-3 and 12-18. Referring to Figure 2, Nakatsuka teaches, "At the time of filtration . . . valve 7 is closed . . . valves 6 and 8 [are opened and] . . . river raw water 1 . . . is supplied . . . with pump 14. . . . Every 45 minutes, [the] operation . . . establishes the reverse washing process which pours permeated water for 1 minute from the penetration side of a filter membrane module, and water recovery is . . . 90%. At the time of the backwash operation, . . . valve 7 [is] opened [and] . . . valves 6 and 8 are closed . . . pump 14 [is] stopped . . . and the back wash . . . supplies some permeated water . . . at the penetration side of the filter membrane module 11 via the pump 15 with operation . . . periodically carried out."

5. To recap, Nakatsuka discloses a method to filter raw river water using permeable, hollow fiber membranes immersed in the raw water. A pressure differential is applied across the hollow membranes and filtrate is drawn off from the center (from the hollow) of the hollow membranes. The method includes a backwash once every 45 minutes for 1 minute. The backwash uses the filtrate and is "periodically carried out," i.e. the backwash is pulsed, as recited in claim 10.

6. Nakatsuka also discloses the recited application of a gas, during backwash, used to push the filtrate back into the bulk liquid surrounding the membranes and, thus, clean the membranes of retained solids. Nakatsuka, Figure 2 and Translation, Detailed Description, ¶ 23, lines 4-7. In the translation, it is stated, "[T]he air 25A which [is] . . . adjusted from the pneumatic pressure cylinder 25 to pneumatic pressure 50 kPa by the pressure regulating valve 27 . . . was [delivered to] . . . the filter membrane module 21 for 1 minute. That is, the gas pressurizing process was

Art Unit: 1797

established." Nakatsuka further teaches that backwashing with gas was known in the art since at least 1995 and that the lessons provided by the art were used to invent a method of chemical washing that included a gas backwash. Nakatsuka, Translation, Detailed Description, ¶ 3, lines 1-5; ¶ 5, lines 1-3.

7. Nakatsuka discloses introducing a cleaning solution in to the lumens in ¶ 18. An example of such a cleaning solution is "citrate and surface-active agent for chemical washing." Nakatsuka, ¶ 18, line 2. The chemical washing can be performed as "one step or [a] multistage" process and "a gas pressurizing process may be suitably put among these washing[s] or into [any] order." Nakatsuka, ¶ 18, lines 3 and 9-10. Furthermore, the cleaning "solution at the time of chemical washing may circulate the raw water side of a filtration membrane, and may be circulated from the raw water side to the penetration side. It may be made to pass from the penetration side of the filtration membrane to the raw water side." Nakatsuka, ¶ 18, lines 11-14. In other words, Nakatsuka discloses a chemical cleaning solution in the lumens (passing from the penetration side of the filtration membrane to the raw water side) and applying a gas pressure to displace the chemical cleaning solution in the lumens (a gas pressurizing process suitably put among the washings or in any order with the washings) so that solids on or in the membranes are removed into the liquid surrounding the membranes, as recited.

8. To summarize, Nakatsuka anticipates all limitations recited in claims 1 and 10.

9. Claim 2 recites all claim 1 limitations with different terminology to describe the application of gas during backwash. As such, the two patentability analyses are similar. To summarize, Nakatsuka anticipates all claim 2 limitations.

10. Claim 3 depends on claim 1 and recites a continuous process with a repetitive cycle of solid accumulation and removal. Nakatsuka discloses that a continuous process was run for eight months with a backwash cycle run once every 45 minutes for 1 minute. Nakatsuka, Translation, Detailed Description, ¶ 22, lines 9-16.

11. Claims 4-9 depend on claim 1 and recite using a chemical cleaning solution [claim 4] which is added either to the outside of the membranes [claims 5 and 7], the inside of the membranes [claim 6] or both sides of the membrane [claims 8 and 9]. Nakatsuka discloses, "The [cleaning] solution at the time of chemical washing may circulate . . . from the raw water side to the penetration side. It may be made to pass from the penetration side of a filtration membrane to a raw water side." Nakatsuka, Translation, Detailed Description, ¶ 18, lines 10-13. The examiner replaced the translated "drug solution" with "cleaning solution" because in that same paragraph, lines 1-3, Nakatsuka also teaches, "In this invention, it can mention using the 'combination drug solution' which combined citrate and a surface-active agent for chemical washing as a kind or two sorts or more of examples for performing in combination." Nakatsuka further teaches that chemical washing solutions can be applied in one stage, multiple stages, and with gas backwash "suitably put among these washing[s] or into [any] order." Nakatsuka, Translation, Detailed Description, ¶ 18, lines 3-10. In summary, Nakatsuka discloses using a chemical cleaning solution [claim 4] which is added either to the outside of the membranes [claims 5 and 7], the inside of the membranes [claim 6] or both sides of the membrane [claims 8 and 9] with gas backwash suitably put among the washings in any order.

12. Claim 11 depends on claim 1 and recites removing at least part of the bulk liquid before the backwashing step. Nakatsuka discloses such removal can be done through open valve 7 in Figure 1 and open valve 38 in Figure 2.

13. In summary, Nakatsuka anticipates all limitations recited in dependent claims 3-9 and 11.

***Claim Rejections - 35 USC § 102***  
***Ford et al. Reference***

14. Claims 1-5, 7, 10, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ford et al. (US Patent No. 4,931,186, Jun. 5, 1990).

15. Regarding claims 1 and 3, Ford et al. discloses, "A method of concentrating solids in a liquid suspension using a filter having a plurality of hollow, microporous . . . fibres with a shell or housing, comprising applying the suspension to an outer surface of the fibres whereby a portion of the suspension passes through the fibre walls and at least a portion of the solids is retained on or in the fibres; and discharging the retained solids by . . . washing out solids retained in the pores by application of gas under pressure." Ford et al. further teaches, "[D]ischarging the retained solid from the shell by applying through the fibre lumens . . . a pressurised gas . . . In one form of the invention, the application of the pressurized gas is initially conducted so as to backwash the full length of the lumens by displacing any lumen liquid with gas at a pressure below the bubble point of the walls of the fibres." Ford et al., Column 4, lines 17-18, 23-24, and 29-33. Ford et al. continues, "Preferably, the method of the invention is carried out as a continuous process utilising a repetitive cycle of solid accumulation and solid discharge." Ford et al., Column 4, lines 43-45.

Art Unit: 1797

16. Regarding the limitation that cleaning solution be introduced to the lumens and then removed with a gas backwash, Ford et al. discloses, "[A] small slug of suitable surfactant may be applied to the feed suspension. . . Example 4 . . . The fibres were previously wetted with a surfactant solution . . . The fibers were then backwashed by the small volume of clarified liquid in the clarified liquid line. . . The air then followed for 10 seconds." Ford et al., Column 13, lines 47-48; Column 14, lines 1, 9-10, and 15-16. Thus, Ford et al. teaches introducing chemical cleaning solution (surfactant) into the lumens and then removing it with a gas (air) backwash.

17. To summarize, Ford et al. anticipates all limitations recited in claims 1 and 3.

18. Claim 2 recites all claim 1 limitations with different terminology to describe the application of gas during backwash. As such, the two patentability analyses are similar. To summarize, Ford et al. anticipates all claim 2 limitations.

19. Regarding claims 4, 5, and 7, Ford et al. discloses, "[A] small slug of suitable surfactant may be applied to the feed suspension. . . Example 4 . . . The fibres were previously wetted with a surfactant solution . . . The fibers were then backwashed by the small volume of clarified liquid in the clarified liquid line. . . The air then followed for 10 seconds." Ford et al., Column 13, lines 47-48; Column 14, lines 1, 9-10, and 15-16. Thus, Ford et al. teaches that the backwashing step includes a chemical cleaning solution [claim 4] that is applied to the outside of the membrane [claim 5] before application of the gas [claim 7].

20. Regarding claim 10, Ford et al. discloses, "Thus the combined pulsed permeate / gas pulse system of the invention is far superior to backwashing with permeate alone in known

fashion." Thus, Ford et al. teaches that the gas is pulsed in its application to the membrane lumens, as recited in the claim.

21. Regarding claim 11, in Figure 4 and at Column 8, lines 9-16, Ford et al. discloses that liquid can be removed from the tank (concentrator 20) through valve 30 to point b labeled "a concentration collection point" prior to the backwashing step.

22. To summarize, Ford et al. anticipates all limitations recited in claims 4, 5, 7, 10, and 11.

***Claim Rejections - 35 USC § 103***  
***Ford et al., in View of Nakatsuka***

23. Claims 6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ford et al. (US Patent No. 4,931,186, Jun. 5, 1990) as applied to claims 4 and 5 above, and further in view of Nakatsuka (Patent Pub. No. JP11076769, Mar. 23, 1999 – The esp@cenet Abstract in English, the publication, and a machine translation to English).

24. Ford et al. discloses the claimed invention except for adding the chemical cleaning solution to inside the membranes. As was shown above, Nakatsuka discloses using a chemical cleaning solution [claim 4] which is added either to the outside of the membranes [claims 5 and 7], the inside of the membranes [claim 6] or both sides of the membrane [claims 8 and 9] with gas backwash suitably put among the washings in any order. It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Ford et al. method, to have added the cleaning solution to the inside of the membranes or to both sides of the membrane as taught by Nakatsuka, since Nakatsuka states in the esp@cenet Abstract, lines 1-9 that cleaning solution in conjunction with a gas backwash is "capable of sufficiently removing an

adsorbed material to the filter membrane" and that the cleaning solution can be added to just the filtrate or to both sides of the membrane. Nakatsuka, Translation, Detailed Description, ¶ 18.

25. In summary, Ford et al., in view of Nakatsuka, discloses or suggests all limitations recited in claims 6, 8, and 9.

### ***Response to Arguments***

26. Applicant's arguments filed January 13, 2009 have been fully considered but they are not persuasive.

27. Regarding claim 1, applicant states, "Claim 1, as amended, sets forth a step for introducing a chemical cleaning solution into the lumens. Further, a gas is applied at a pressure below the bubble point for progressively displacing some of the chemical cleaning solution within the lumens through the membrane pores which results in removal of the solids retained on or in the hollow membranes." Applicant's Remarks, p. 8, lines 17-21. Applicant further states that claim 2 "includes similar subject matter to that of claim 1." Applicant's Remarks, p. 9, line 4.

4. Applicant's arguments are listed below, with the examiner's response after each argument.

- a. Regarding the 102 rejections under Nakatsuka, applicant argues, "By contrast, Nakatsuka indicates that the use of gas pressurization is separate from the introduction of the chemical solution" and cites the esp@cenet Abstract, lines 16-22 and Example 1 in the machine translation (p. 5, lines 1-13 to p. 6, lines 1-4 and p. 6, lines 44-48). Applicant's Remarks, p. 8, lines 22-23. Applicant summarizes, "Therefore, the gas pressurization in Nakatsuka is not used to displace the chemical

cleaning solution back through the membrane as set forth in amended claim 1.”

Applicant's Remarks, p. 9, lines 1-2.

The examiner responds as in the above patentability analysis. Nakatsuka discloses introducing a cleaning solution in to the lumens in ¶ 18. An example of such a cleaning solution is “citrate and surface-active agent for chemical washing.” Nakatsuka, ¶ 18, line 2. The chemical washing can be performed as “one step or [a] multistage” process and “a gas pressurizing process may be suitably put among these washing[s] or into [any] order.” Nakatsuka, ¶ 18, lines 3 and 9-10. Furthermore, the cleaning “solution at the time of chemical washing may circulate the raw water side of a filtration membrane, and may be circulated from the raw water side to the penetration side. It may be made to pass from the penetration side of the filtration membrane to the raw water side.” Nakatsuka, ¶ 18, lines 11-14. In other words, Nakatsuka discloses a chemical cleaning solution in the lumens (passing from the penetration side of the filtration membrane to the raw water side) and applying a gas pressure to displace the chemical cleaning solution in the lumens (a gas pressurizing process suitably put among the washings or in any order with the washings) so that solids on or in the membranes are removed into the liquid surrounding the membranes, as recited.

- b. Regarding the 102 rejections under Ford, applicant argues, "Ford et al., by contrast, does not disclose the use of a gas to progressively displace a chemical cleaning solution within the lumens through the membrane pores to remove solids. Rather,

Ford discloses the use of gas on a clarified liquid" and cites col. 6, line 65 to col. 7, line 22. Applicant's Remarks, p. 9, lines 14-17.

The examiner responds as in the above patentability analysis. Regarding the limitation that cleaning solution be introduced to the lumens and then removed with a gas backwash, Ford et al. discloses, "[A] small slug of suitable surfactant may be applied to the feed suspension. . . Example 4 . . . The fibres were previously wetted with a surfactant solution . . . The fibers were then backwashed by the small volume of clarified liquid in the clarified liquid line. . . The air then followed for 10 seconds." Ford et al., Column 13, lines 47-48; Column 14, lines 1, 9-10, and 15-16. Thus, Ford et al. teaches introducing chemical cleaning solution (surfactant) into the lumens and then removing it with a gas (air) backwash. The intervention of a "small volume of clarified liquid" backwash step does not negate that Ford et al. has disclosed applying a gas to the lumens to "progressively displace at least some of the chemical cleaning solution within the lumens through the membrane pores," as recited.

- c. Regarding the 103 rejections under the combination of Nakatsuka and Ford, applicant argues, "Nakatsuka merely discloses gas pressurization of the permeate side either **before or after, or both before and after**, the chemical cleaning solution has been circulated on the feed side. In addition, Ford et al. does not even contemplate the use of a chemical cleaning solution in conjunction with gas pressurization." Applicant's

Remarks, p. 10, lines 5-9. Applicant continues, "Neither Nakatsuka nor Ford et al., alone or in combination, suggest Applicant's inventive process where alternating filtration and reverse flow using gas pressure are used to draw a chemical cleaning solution back and forth through the membranes in repeated cycles."

The examiner responds that Point (a) above addresses applicant's argument regarding that Nakatsuka reference. Point (b) above addresses applicant's argument regarding the Ford et al. reference. As such, the above patentability analysis shows that Nakatsuka anticipates all limitations recited in claims 1-11; Ford et al. anticipates all limitations recited in claims 1-5, 7, 10, and 11; and Ford et al., in view of Nakatsuka, discloses or suggests all limitations recited in claims 6, 8, and 9.

### ***Conclusion***

28. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
29. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1797

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is (571)270-3166. The examiner can normally be reached on Monday through Thursday, from 8:00 am to 6:00 pm.

31. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

32. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA

/Walter D. Griffin/  
Supervisory Patent Examiner, Art Unit 1797